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1762

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/691,972

Applicant(s)

UMEYA, MASANORI

Examiner

Elena Tsoy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 7/21/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

Claim Objections

1. Claim 5 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 4 on which claim 5 depends on, requires a fourth step of leaving a film formed in a second step “as it is”. However, claim 5 requires heating in the same fourth step. For examining purposes claim 5 was interpreted as depending on claim 1.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. Claims 1 and 6 omit an essential step of bringing the applied film phase to a supercooled phase so that to carry out a third step of curing while **holding** the phase of the film to the supercooled one.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this

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subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-8 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nishimura (US 6671031).

Nishimura discloses a process of producing cholesteric liquid crystal film comprising: a first step of applying, to a substrate having alignment power (See column 11, lines 26-64), a cholesteric liquid crystal solution (See column 12, lines 9-10, 23-25) prepared by dissolving a radiation-polymerizable cholesteric liquid crystalline material (See column 2, lines 33-37; column 3, lines 66+; column 6, lines 12-14) in a solvent (See column 10, lines 29-52), thereby forming a film; a second step of removing the solvent from the film formed in the first step, thereby obtaining an uncured cholesteric liquid crystal film (See column 12, lines 23-30); fixing a *cholesteric* alignment formed with the liquid crystal material while removing the solvent (See column 12, lines 23-27) or by heating of dried film (See column 12, lines 33-37), and then crosslinking the liquid crystal material in a cholesterically aligned state by *radiation* (See column 13, lines 37-58) so as to form a liquid crystal film with a cholesteric alignment fixed and providing a region exhibiting a diffraction capability on at least a part of the liquid crystal film (See Abstract; column 12, lines 59-63).

As to a supercooled phase, Nishimura teaches that the *alignment* formation is performed by a heat treatment, this heat treatment and that for the crosslinking reaction can also be carried out separately in their mutually different heat treatment atmospheres (See column 12, lines 33-40). After forming the alignment by the heat treatment, **cooling** is preferably conducted to fix the cholesteric alignment by a cooling operation by e.g. transferring the film from the heat treatment atmosphere required for the alignment formation to the **room** temperature condition and allowing it to cool (claimed fourth step) (See column 13, lines 19-36). The light for the light irradiation for the cholesteric alignment can be selected from known means such as electron beams, ultraviolet rays, visible rays or infrared rays (heat rays) (See column 13, lines 38-58).

Since Applicants' specification describes that supercooling phase is achieved by leaving the film after heating at room temperature (See Abstract and P11), the step of transferring the film from the heat treatment atmosphere required for the alignment formation to the **room** temperature condition and **allowing it to cool** in Nishimura achieves claimed supercooling phase.

Although the atmospheric temperature at which the light irradiation is conducted is appropriately selected according to the physical and chemical properties of the coat layer, it is in the range of generally 0 to 200⁰C, preferably 20 to 180⁰C and more preferably 25 to 160⁰C (See column 13, lines 65+). However, in the case where the liquid crystal material having a *high order* phase such as a smetic phase of a crystal phase at a low-temperature range around room temperature and having a chiral nematic phase in a temperature range higher than the low-temperature range is fixed in a chiral nematic phase state by photo-crosslinking, the light irradiation should sometimes be conducted at a temperature higher than or equal to the phase

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transition point of high order phase-chiral nematic phase. Whereas when the nematic phase has been already fixed by supercooling in the heat treatment process preceding the photo-crosslinking, the light irradiation may properly be conducted after *reheating* the coat layer so as to impart the fluidity thereto because of the low crosslinking rate of the liquid crystal layer.

In other words, since Nishimura teaches that *reheating* before curing is required for a *high order* phase such as a smectic or chiral nematic phase, obviously, fixing cholesteric phase by photocuring can be carried out *without* pre-heating at room temperature.

It is the Examiner's position that the cholesteric liquid crystal film produced by the process of Nishimura has all claimed properties and functions, e.g. circularly-polarized-light-separating properties, as required by claim 1, or the phase of the uncured cholesteric liquid crystal film formed in the second step being held to a supercooled cholesteric one with liquid crystalline molecules in *planar orientation*, as required by claim 2, and so on since it is prepared by a process substantially identical to that of claimed invention.

It is held that where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, claimed properties or functions are presumed to be inherent. See MPEP 2111.02, 2112.01. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

As to a circularly-polarized-light-separating element, Nishimura teaches that a polarization diffraction film by imparting the diffraction capability to a part of the liquid crystal

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film (See column 15, lines 19-25). The polarization diffraction film has extensive uses as the foregoing spectroscopic optical instrument requiring a spectrally split polarization light, an optical filter, or a circularly polarizing plate (See column 22, lines 30-48).

As to claims 6-8, it is well known in the art that the spectroscopic optical instrument requiring a spectrally split polarization light may use multiple cholesteric liquid crystal layers. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed another cholesteric liquid crystal layer on the cured first cholesteric liquid crystal layer using the same method depending on the use of a final product.

Also it is a well-known principle to reapply a coating composition to achieve a desired thickness of a final coating depending on intended use of the final coated product.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have reapplied a cholesteric liquid crystal coating in Nishimura, according to well-known principle, with the expectation of providing the desired thickness of a final coating.

7. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamoto et al (US 6882475) in view of Nishimura, further in view of Gibbons et al (US 6103322).

Kawamoto et al a method for producing a polarizer comprising preparing at least two kinds of 3 micron-thick cholesteric liquid-crystal layers with selective reflection center wavelengths of 780 nm, 730 nm, 680 nm, 630 nm, 580 nm, 530 nm and 480 nm were formed individually on a triacetyl cellulose (TAC) substrate film by applying a cyclohexanone solution containing a cholesteric liquid-crystal polymer exhibiting liquid crystal characteristic at a temperature of 90 to 200⁰C (glass transition temperature: 90⁰C) on a triacetyl cellulose (TAC) film provided with a rubbing-oriented film of polyvinyl alcohol, removing the solvent, heating

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the cholesteric liquid-crystal polymer to 160⁰C so that liquid crystal was aligned, then cooling the liquid-crystal polymer to **room** temperature; separating each of the at least two kinds of the cholesteric liquid-crystal polymer films from the TAC substrate, then, transferring the cholesteric liquid-crystal layer onto a cholesteric liquid-crystal layer with a selective reflection center wavelength of 780 nm through acrylic tacky layer in descending order of selective reflection center wavelength (See Example 2). As the cholesteric liquid-crystal layer, any suitable cholesteric liquid-crystal layer that exhibit characteristic such that a light component of one of left- and right-handed circularly polarized light beams of the incident light can be used (See column 5, lines 9-14). There is no particular limitation in kind of the cholesteric liquid-crystal layer (See column 5, lines 15-16). The circularly polarized light separating sheet may have a structure in which **two** cholesteric liquid-crystal layers or three or more cholesteric liquid-crystal layers different in reflection wavelength range are superposed on one another in order to obtain circularly polarized light transmitted in a wide wavelength range (See column 5, lines 16-23).

Kawamoto et al fail to teach that the cholesteric liquid-crystal polymer is a photopolymerisable polymer which is cured at room temperature by radiation (Claim 1).

Nishimura are applied here for the same reasons as above. Nishimura teaches that the use of a photopolymerisable *circularly* polarizing cholesteric liquid-crystal polymer which is cured at room temperature by radiation allows to fix the cholesteric alignment (See above).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a photopolymerisable *circularly* polarizing cholesteric liquid-crystal polymer in Kawamoto et al with the expectation of providing the desired fixed cholesteric

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alignment, as taught by Nishimura, since Kawamoto et al teach that there is no particular limitation in kind of the cholesteric liquid-crystal layer.

Kawamoto et al in view of Nishimura fail to teach that instead of laminating preformed layers, a further cholesteric liquid-crystal polymer layer is formed on the cured cholesteric liquid-crystal polymer layer (Claim 6).

Gibbons et al teach that applying a liquid crystal medium to the optical alignment layer can be accomplished by capillary filling of a cell, by casting of a liquid crystal medium onto an optical alignment layer, by laminating a preformed liquid crystal film onto an optical alignment layer or by other methods (See column 8, lines 43-48). Optical alignment layers of the invention are compatible with all liquid crystal display modes. A liquid crystal display element of the invention can comprise a variety of display configurations including twisted nematic, super twisted nematic, in-plane-switching, vertical alignment, active-matrix, cholesteric (See column 11, lines 42-47). In other words, Gibbons et al teach that casting of cholesteric liquid crystal medium onto a substrate layer is functionally equivalent to laminating a preformed cholesteric liquid crystal film onto the substrate layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed a second cholesteric liquid-crystal polymer layer in Kawamoto et al in view of Nishimura by casting using a method of Nishimura instead of laminating preformed layers since Gibbons et al teach that casting of cholesteric liquid crystal medium onto a substrate layer is functionally equivalent to laminating a preformed cholesteric liquid crystal film onto the substrate layer.

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8. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kameyama et al (US 6166790) in view of Nishimura, further in view of Gibbons et al.

Kameyama et al disclose a method for producing a polarizer comprising a layer 1 having a function of separating incident light into polarized light through reflection and transmission (**circularly polarized** light separation layer) wherein 11 indicates a supporting substrate, and the reference numerals 12 and 13 indicate **cholesteric liquid crystal layers** (See Fig. 2; column 3, lines 63-68; column 4, lines 1-2). The liquid crystal polymers can be developed, for example, by methods in which solutions of the liquid crystal polymers in solvents are developed in thin layers by e.g. cast film formation, followed by drying (See column 7, lines 6-15). The heating treatment for orienting developed layers of the liquid crystal polymers can be conducted by heating the layers within the temperature range from the glass transition temperature to the isotropic phase transition temperature, namely within the temperature range in which the liquid crystal polymers exhibit liquid crystal phases (See column 7, lines 24-30). Further, the oriented state can be fixed by *natural cooling* the layers to less than the glass transition temperature, and there is no particular limitation on the cooling conditions (See column 7, lines 30-39). A circularly polarized light separation layer changing in helical pitch in the direction of thickness can be produced, for example, by pressing two or more oriented cholesteric liquid crystal polymer layers on each other under heating (See column 7, lines 53-63). Kameyama et al teach that there is no particular limitation on the cholesteric liquid crystal polymers (See column 5, lines 62-63).

Kameyama et al fail to teach that the cholesteric liquid-crystal polymer is a photopolymerisable polymer which is cured at room temperature by radiation (Claim 1).

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Nishimura are applied here for the same reasons as above. Nishimura teaches that the use of a photopolymerisable *circularly* polarizing cholesteric liquid-crystal polymer which is cured at room temperature by radiation allows to fix the cholesteric alignment (See above).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a photopolymerisable *circularly* polarizing cholesteric liquid-crystal polymer in Kameyama et al with the expectation of providing the desired fixed cholesteric alignment, as taught by Nishimura, since Kameyama et al teach that there is no particular limitation on the cholesteric liquid crystal polymers.

Kameyama et al in view of Nishimura fail to teach that instead of laminating preformed layers, a further cholesteric liquid-crystal polymer layer is formed on the cured cholesteric liquid-crystal polymer layer (Claim 6).

Gibbons et al are applied here for the same reasons as above. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed a second cholesteric liquid-crystal polymer layer in Kameyama et al in view of Nishimura by casting using a method of Nishimura instead of laminating preformed layers since Gibbons et al teach that casting of cholesteric liquid crystal medium onto a substrate layer is functionally equivalent to laminating a preformed cholesteric liquid crystal film onto the substrate layer.

9. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura in view of Kawamoto et al/Kameyama et al/, further in view of Gibbons et al.

Nishimura are applied here for the same reasons as above. Nishimura fails to teach that a second layer is formed on a first crystal layer (Claim 6).

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Kawamoto et al/Kameyama et al/ are applied here for the same reasons as above.

Kawamoto et al/Kameyama et al/ teach that two layers of crystal layers can be used in making polarizers. They teach that the two layers of crystal layers can be preformed individually, and then laminated to each other (See above).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed a second cholesteric liquid-crystal polymer layer on the first layer of Nishimura depending on the use, e.g. for making a polarizer, as taught by Kawamoto et al/Kameyama et al/.

Gibbons et al are applied here for the same reasons as above.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed a second cholesteric liquid-crystal polymer layer in Nishimura in view of Kawamoto et al/Kameyama et al/ using the same method as for forming a first layer of Nishimura instead of laminating a preformed layer since Gibbons et al teach that casting of cholesteric liquid crystal medium onto a substrate layer is functionally equivalent to laminating a preformed cholesteric liquid crystal film onto the substrate layer.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is 571-272-1429. The examiner can normally be reached on Monday-Thursday, 9:00AM - 5:30 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Elena Tsoy
Primary Examiner
Art Unit 1762

ELENA TSOY
PRIMARY EXAMINER



October 25, 2006